

SACRAMENTO FIRE WEATHER 2010 ANNUAL SUMMARY



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A cool, wet spring set the stage for a quiet northern California fire season in 2010. Storms moved through the region almost weekly in April and May. Average temperatures throughout the region were 3.4 degrees below normal in April and 4.0 degrees below normal in May. Some locations in the mountains and foothills received 5 to 6 inches more precipitation than normal in May. 1000-hr fuels stayed wet into the summer. Below 1000 feet, grasses cured two to three weeks behind schedule (early May). The May rains caused a second crop of grasses to poke up below 2000 feet as Chemise and Manzanita fuel moistures ran well above normal. Fuel moistures experienced big spikes in May, then remained above average through early August.

Northern California had a beautiful summer. Low pressure generally remained anchored over the Pacific Northwest. Below normal sea surface temperatures persisted off the central California coast. As low pressure systems shifted inland, they brought cooler ocean air with them. July and August temperatures were two to three degrees below normal in the central valleys. There were only 14 days that exceeded 100 degrees in Sacramento last summer (the normal is 22). Gusty southwest winds frequently occurred in the mountains and through the Delta. Their impact was mitigated by moist fuels and cool temperatures. A persistent southwest flow aloft kept monsoonal moisture and instability shunted away from northern California. A front did spark some lightning fires in late June. Most of these were not in our area; remaining confined to Modoc and Lassen counties.

An offshore low pressure system produced a round of thunderstorms with about 500 lightning strikes across northern California August 14 – 15. Again, most of the lightning was north and east of our area and no Red Flag products were necessary. Gusty southwest winds prompted the issuance of Red Flag Warnings for the Burney Basin (zone 214) on August 17th, 20th and 25th. The Lassen Park area (zone 268) was included in the warning on the 25th. Fuel moistures finally fell to near normal levels in August but a period of wet weather brought them back up in September. There were some gusty north winds in early October that prompted the issuance of Red Flag Warnings. By the end of the October, a series of upper level disturbances brought cool temperatures and widespread showers to the region.

35,674 acres burned in northern California in 2010. This was the lowest amount since 1998 and is only 24% of the 15-year average of 151,065 acres. This average does not factor in the extreme 2008 fire season data. In the last 17 years, only 1998 (33,182 acres burned), 1995 (20,605 acres) and 1997 (19,401 acres) had less wildfire activity than 2010.

The **Bar Fire** began on 8/1. The cause is still under investigation. The fire was in the Plumas NF in the Feather River Canyon north of Highway 70. It forced the closure of highway 70 and threatened several structures as it grew to over 1,000 acres. Full containment was achieved on 8/11.

The **Caribou Complex** was a complex of four separate fires that began on 8/14 in the Plumas NF. The cause of these remains under investigation. The fires forced the closure of portions of highway 70 as they collectively grew to over 400 acres. Full containment was achieved on 8/16.

The **Baseline Fire** started on 8/20 in Placer County near the city of Roseville. It spread rapidly in grass, burning over 400 acres; prompting evacuations and threatening structures. The fire was contained later that day. The cause remains under investigation.

The **Pinecrest Fire** was started by lightning in the Stanislaus National Forest in late August. The fire initially grew to 288 acres, but rocky terrain and higher than normal fuel moisture limited its growth. The fire grew to 811 acres by September 7th. It posed no threat to the public and was allowed to burn itself out in a remote area. STO continued to receive spot forecast requests from this fire into late September.

The **Indian Fire** was a man made fire at the north end of the Indian Valley Reservoir in Lake County. The fire started on 8/24 and grew to 363 acres. It was suppressed two days later.

The **Ballard Fire** in Yuba County was a man made fire ignited in Yuba County on 8/27. A type II team was dispatched to this fire, which burned in steep and rocky terrain in the north Yuba drainage within the Tahoe NF. The fire was fully contained by 8/31. It grew to 1300 acres at its peak.

The **Wetsel Fire** was a small man made fire that was ignited in Placer County 9/2. It remained smaller than 200 acres and was extinguished by the Amador/El Dorado unit the following day.

The **Black Fire** was another man made fire that began 9/24 in the El Dorado NF. It was quickly extinguished by Grass Valley CAL-FIRE before it could exceed 200 acres.

In general, above average fuel moistures kept fires that did manage to start from growing too fast. The quiet season across much of the country also allowed resources to be kept close to home; making for a fast response time in 2010.

RED FLAG WARNING VERIFICATION FOR 2010

STO issued 13 individual zone based Red Flag Warnings in 2010. This was down from 39 in 2009, and of course well below the number issued in 2008 (184). The total of 13 Red Flag Warnings represents the lowest total since 2003. All of the warnings were issued for gusty wind and low humidity.

MONTH	FIRE WX WATCHES	RED FLAG WARNINGS	
		Wind / Low RH	Dry Lightning
June	5	6	0
July	0	0	0
August	2	4	0
September	0	0	0
October	0	3	0

Red Flag Warning verification can be subjective, especially with regard to dry lightning. To verify as a correct warning for winds and RH, we refer to the matrix agreed upon by the California Wildfire Coordinating Group (CWCG):

The wind event should be expected to last for at least 8 hours to qualify for a red flag warning.

W indicates that the forecaster should consider a warning.

Relative Humidity	Sustained Wind 6-11 mph	Sustained Wind 12-20 mph	Sustained Wind 21-29 mph	Sustained Wind 30+ mph
Daytime Minimum RH 29-42% and/or Nighttime Maximum RH 60-80%				W
Daytime Minimum RH 19-28% and/or Nighttime Maximum RH 46-60%			W	W
Daytime Minimum RH 9-18% and/or Nighttime Maximum RH 31-45%		W	W	W
Daytime Minimum RH < 9% and/or Nighttime Maximum RH < 31%	W	W	W	W

STO verified all but one of the Red Flag Warnings issued in 2010. There was one missed event for gusty winds in the Burney Basin. This resulted in a POD of 0.92, which is similar to 2009 (0.95) and 2008 (0.98). STO continues to do a good job with low RH /

gusty wind Red Flag Warnings. The October Red Flag Warnings were issued with no preceding Fire Weather Watch and only 4.6 hours of lead time. Lead time was better in August (20.5 hours). The June warnings had 6.1 hours of lead time. Overall lead time averaged 10.5 hours. This is down from the previous three years (20.4, 21.6 and 21.5 hours for 2009, 2008 and 2007 respectively). The reduced lead time was probably due to the limited number of events.

STO issued no Red Flag Warnings for dry lightning in 2010. There were no missed lightning events.

Statistically, POD is the ratio of warned events to total events. So if

A= the # of correct warnings

B= the number of incorrect warnings

C= the number of events not warned

Then $POD = A / (A+C)$

FAR is the ratio of warnings without an event to total warnings: $B / (A+B)$

$CSI = A / (A+B+C)$

2010 Red Flag Warnings

	Synoptic Scale	Dry Thunderstorms	Total or Average
Number of Red Flag Warnings	13	0	13
Number of Correct Warnings	12	0	12
Number of Incorrect Warnings	1	0	1
Number of Events Not Warned	1	0	1
POD for Red Flag warnings	92.3%	n/a	92.3%
CSI for Red Flag warnings	85.7%	n/a	85.7%
FAR for Red Flag warnings	00.8%	n/a	00.8%
Red Flag warning Lead Times	10.5 Hours	n/a	10.5 Hours

The CSI of .857 for Red Flag Warnings was much improved from 2009 (.614). With no Red Flag issues for dry lightning to worry about, STO had a remarkable FAR of .008.

2010 Fire Weather Watches

	Synoptic	Dry Thunderstorms	Total or Average
Number of Fire Weather Watches	7	0	7
Number of Watches Verified	6	0	6
Lead time of verified Watches	26.8 hours	0 hours	26.8 hours

STO issued seven zone based Fire Weather Watches in 2010; down from 40 in 2009 and 117 in 2008. Six of the seven watches verified with an average lead time of 26.7 hours. This is down from 31.5 hours in 2009.

SPOT FORECASTS ISSUED FOR THE YEAR 2010

WFO Sacramento issued 409 spot forecasts last season; our third highest total ever and similar to the 435 issued in 2009. 2008 remains number one overall with 517 spot forecasts. We saw an increase in the number of wildfire spots (110 vs. 82) in 2010. This was largely due to the Pinecrest Fire in the Stanislaus National Forest, which was allowed to burn from early August into September. The number of prescribed burn spot forecast requests dropped to 266 from 304 the previous year. October (68) and November (47) continue to be the busiest months for prescribed burning spot forecasts. However, June (44) made a close run for the second busiest month this year.

While October and November of 2010 were fairly steady with prescribed burning spot forecast requests; their numbers were well down from the previous year. October of 2009 had 85 spot requests vs. 68 this year; and November's 44 RX spots were down from 80 a year ago.

Month	Rx Burns	Wildfire	WFU	HAZMAT	Training	Other
JAN	10	0	0	0	0	0
FEB	11	0	0	0	0	0
MAR	15	0	0	0	0	0
APR	9	0	0	0	0	0
MAY	11	0	0	0	0	0
JUN	44	5	5	0	19	0
JUL	16	5	1	0	3	0
AUG	20	44	0	0	0	0
SEP	3	46	3	0	0	0
OCT	68	10	0	0	0	1
NOV	47	0	0	1	0	0
DEC	12	0	0	0	0	0
TOTAL	266	110	9	1	22	1

There was an increase in prescribed burning spot requests from local municipalities in 2010, as well as from the U.S. Fish and Wildlife. Again, note the higher number of wildfire spot requests headed by the Stanislaus National Forest. It looks like the forests and CAL-FIRE did less burning in 2010 than in 2009. Removing the extreme fire season numbers of 2008, we had seen a steady increase in spot forecast requests from 2007 (364), 2006 (324), 2005 (269) and 2004 (234).

Spot Forecast Requests	2010	2009	2008
Wildfires (USFS)	95	22	241
Wildfires (CALFIRE)	15	14	61
Burns (USFS)	173	225	140
Burns (CALFIRE)	39	99	39
Burns (US Fish / Wildlife)	58	48	25
Burns (NPS)	0	7	5
WFU	9	20	5
HAZMAT (OES)	1	0	1
Burns (local)	19	0	0

WFO Sacramento had an average spot forecast completion time of 37.4 minutes in 2010 (wildfire spots). This was a little slower than 2009 (31.7 minutes), but better than 2008's completion time average (46.5 minutes).

INCIDENT METEOROLOGIST DISPATCHES FOR 2010

Sacramento fire weather participated in 2 IMET dispatches in 2010. Many IMETs saw no activity this year because it was such a quiet fire season across the country. IMET trainee Steve Goldstein was dispatched to the Tecolote Fire northwest of Las Vegas, N.M. on June 18th; then transferred to the Schultz Fire near Flagstaff, AZ on June 22nd. STO provided 15 days of IMET support in 2010, down from 36 days in 2009 and 47 days in 2008.

Steve Goldstein became a certified IMET on the Schultz Fire in July, giving WFO STO three certified IMETS. The breakdown of WFO STO IMET dispatches including incident name, dates dispatched and fire weather district of the incident is as follows:

Incident Name	IMET	Dispatch Dates	Fire Weather District
Tecolote Fire	Steve Goldstein	6/18/10-6/22/10	Albuquerque, NM
Schultz Fire	Steve Goldstein	6/22/10-7/1/10	Flagstaff, AZ

Number of days on incidents in 2010:

Mike Smith 0
Steve Goldstein 15
Jason Clapp 0

Total Days of IMET support
from WFO Sacramento..... 15

FIRE WEATHER TRAINING ASSIGNMENTS IN 2010

Sacramento fire weather participated in 14 teaching assignments in 2010, down from 23 in 2009 and similar to the 13 that occurred in 2008. Jason Clapp was a huge help this year, teaching four "Basic Fire Behavior" S-290 courses. Mike Smith also taught two S-390 courses, two S-490 courses and an S-590 Advanced Fire Behavior course. WFO Sacramento continues to be a big help to state and local agencies that must comply with the S-290 wildland fire fighting course.

Special thanks go to Mike Smith, who continues to shoulder a large teaching workload each year.

The courses taught, locations, agency served and instructors follow:

<u>Course Name</u>	<u>Location</u>	<u>Date</u>	<u>Agency Served</u>	<u>Instructor</u>
Wldnd Fire Calc S-390	Magalia	1/19-1/20	CALFIRE	Mike Smith
Basic Fire Behavior S-290	Grass Vly	2/08-2/09	CALFIRE	Jason Clapp
Adv Wldnd Fire Calc S-490	McClellan	2/23-2/24	USFS	Mike Smith
Basic Fire Behavior S-290	Consumnes Fire Dept.	3/01-3/02	Various	Mike Smith
Basic Fire Behavior S-290	McClellan	3/02-3/03	USFS	Jason Clapp
Adv Fire Behavior S-590	Tucson	3/08-3/19	Various	Mike Smith
Basic Fire Behavior S-290	Cameron Pk	3/30-3/31	CALFIRE	Jason Clapp

Basic Fire Behavior S-290	Auburn	4/05-4/06	CALFIRE	Jason Clapp
Wldnd Fire Calc S-390	Cameron Pk	4/06-4/07	CALFIRE	Mike Smith
Adv Wldnd Fire Calc S-490	Ione	4/13-4/14	CALFIRE	Mike Smith
Basic Fire Behavior S-290	Vacaville	5/24-5/25	USFS	Mike Smith
Basic Fire Wx Refresher	Pollock Pines	5/26	USFS	Mike Smith
Basic Fire Behavior S-290	Paradise	6/07-6/08	USFS	Mike Smith
Basic Fire Behavior S-290	Sonora	6/15-6/16	CALFIRE	Mike Smith